

What is claimed is:

- 1 1. A turbine blade assembly comprising:  
2 a platform having a leading edge face, a trailing edge face, a first side and a  
3 second side;  
4 an airfoil portion extending from the platform;  
5 a hollow shank portion disposed beneath the platform;  
6 a cooling channel extending through the platform beginning in an area near  
7 the leading edge face and extending through the trailing edge face of the platform,  
8 the cooling channel extending substantially proximate to the first side of the platform;  
9 and  
10 a plurality of cooling holes extending between the hollow shank portion and  
11 the cooling channel, wherein the cooling holes are oriented substantially transverse  
12 to the cooling channel.
- 1 2. The blade assembly of claim 1 wherein the cooling channel is substantially  
2 oval shaped.
- 1 3. The blade assembly of claim 1 wherein the cooling channel is substantially  
2 oblong shaped.
- 1 4. The blade assembly of claim 1 wherein the cooling channel has substantially  
2 rounded corners.
- 1 5. The blade assembly of claim 1 wherein the cooling channel includes an upper  
2 wall and a lower wall, wherein the upper and lower walls are substantially flat.
- 1 6. The blade assembly of claim 5 wherein the upper and lower walls are  
2 substantially parallel.
- 1 7. The blade assembly of claim 1 wherein the cooling holes are substantially  
2 circular in cross-section.

1 8. The blade assembly of claim 1 further comprising a second cooling channel  
2 extending through the platform beginning in an area near the leading edge face and  
3 extending through the trailing edge face of the platform, the second channel  
4 extending substantially proximate to the second side of the platform; and  
5 a plurality of cooling holes extending between the hollow shank portion and  
6 the second cooling channel, wherein the cooling holes are oriented substantially  
7 transverse to the second cooling channel.

1 9. The blade assembly of claim 1 further comprising a branch channel in fluid  
2 communication with the cooling channel, the branch channel including an edge  
3 segment and an exhaust segment, wherein the edge segment extends substantially  
4 proximately along at least a portion of the trailing edge face of the platform.

1 10. The blade assembly of claim 9 wherein the platform includes a top surface,  
2 and the exhaust segment extends upward from the edge segment and through the  
3 top surface of the platform.

1 11. The blade assembly of claim 1 wherein the cooling channel is partially  
2 restricted by a cover.

1 12. The blade assembly of claim 11 wherein the cover is one of a plate or a plug.

1 13. The blade assembly of claim 11 further comprising an additional channel, the  
2 cooling channel and the additional channel being in fluid communication, wherein the  
3 additional channel is disposed between the cooling channel and the first side of the  
4 platform.

1 14. The blade assembly of claim 11 further comprising one or more passages  
2 extending between the cooling channel and one of the sides of the platform.

1 15. The blade assembly of claim 11 further comprising one or more passages  
2 extending between the cooling channel and the top surface of the platform.

1 16. A turbine blade assembly comprising:  
2 a platform having a leading edge face, a trailing edge face, a first side and a  
3 second side;  
4 an airfoil portion extending from the platform;  
5 a hollow shank portion disposed beneath the platform;  
6 a first cooling channel extending through the platform beginning in an area  
7 near the leading edge face and extending through the trailing edge face of the  
8 platform, the first cooling channel extending substantially proximate to the first side  
9 of the platform;  
10 a second cooling channel extending through the platform beginning in an area  
11 near the leading edge face and extending through the trailing edge face of the  
12 platform, the second cooling channel extending substantially proximate to the  
13 second side of the platform,  
14 wherein each of the cooling channels is defined by a substantially flat top  
15 surface and substantially flat bottom surface and two curved side walls connecting  
16 between the top and bottom surfaces, the top and bottom surfaces being  
17 substantially parallel to each other; and  
18 a first set of cooling holes extending between the hollow shank portion and  
19 the bottom surface of the first cooling channel, a second set of cooling holes  
20 extending between the hollow shank portion and the bottom surface of the second  
21 cooling channel, wherein the first and second cooling holes are oriented substantially  
22 transverse to the first and second cooling channels.